

# Petr Stepanov

Materials science. Gamma spectroscopy. Data analysis and computer simulations.

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## Summary

Ph.D. graduate with expertise in gamma spectroscopy, positron annihilation spectroscopy, microscopy, and nuclear physics. Strong background in computational techniques: data analysis, particle simulations, software development (desktop and web applications).

Graduated from [BGSU](https://www.bgsu.edu/) in May 2020. Seeking to become an effective member of a research group in the industry. Authorized to work in the US on [Optional Practical Training](#) (OPT) in physics, chemistry, and computer science. OPT expires in February 2023. Will consider visa sponsorship offers.

## Computer Skills

**Simulation and data analysis:** Geant4, CERN ROOT, Wolfram Mathematica, Maple.

**Academic writing:** LaTeX, MS Office Suite, Zotero.

**Data plotting:** OriginLab, Gnuplot, QtiPlot, SciDaVis, Grapher.

**Desktop applications development:** C/C++ and Qt, GNU Automake, CMake, Java and Swing, Python, Fortran.

**UI/UX design:** Figma, Sketch, Adobe Photoshop, Adobe Illustrator, Inkscape, Blender.

**Frontend:** HTML, CSS (LESS and SASS), Bootstrap, responsive web design, JavaScript and jQuery, npm, gulp, AngularJS, React.js. Google Web Toolkit. PHP and WordPress themes development.

## Material Research Skills

**Characterization facilities.** Positron Lifetime and Doppler Broadening Annihilation Spectroscopy (PALS, DBAR). Atom Probe Tomography (ATP). Scanning Electron Microscopy (SEM). Transmission electron microscopy (TEM). Atomic Force Microscopy (AFM). UV-VIS Spectroscopy. Fourier Transform Infrared Spectroscopy (FTIR).

**Material processing.** High-temperature annealing. Wet chemical etching. Electrical Contact Fabrication. Sample polishing.

# Work Experience

## Research Collaborator (On-Site)

[Thomas Jefferson National Accelerator Facility \(JLab\)](#) Jul 2020 - Current

- Applied CERN ROOT framework (C++) to perform statistical analysis of a significant amount (over 100 GB) of the raw experimental data of the [Kaon LT](#) experiment at JLab. [Link to GitHub](#).
- Utilized SLURM environment on [JLab supercomputer environment](#) to run resourceful particle simulations on multiple computing nodes at the same time. This decreased the wall computation time by more than 10 times.
- Proposed and implemented RAMDisk functionality on the development environment. This lead to an over 60% increase in source code indexing time.
- Set up data acquisition system that performs triggered waveform acquisition from Tektronix oscilloscope to a local Network Attached Storage (NAS) device. RedHat, Ethernet, SAMBA, Python, National Instruments VISA library.
- Active collaborator of the [Pion LT project](#). Committed more than 50 shifts performing Target Operator and Shift Leader duties in the experimental Hall C counting room.

## Postdoctoral Researcher (Remote)

[Catholic University of America \(CUA\)](#) Jul 2020 - Current

- Applied Machine Learning (ML) TMVA framework to perform binary classification of thousands of signals from a data acquisition (DAQ) setup. [Link to GitHub](#).
- Developed a computer simulation based on the Geant4 framework (C++, CMake, Eclipse IDE, gdb) to study optical properties of a novel scintillation material to be used in the EIC detector system. [Link to GitHub](#).
- Teaching experience: mentoring students within a 3-month Research Experiences for Undergraduates (REU) program at the Physics Department at CUA. Giving talks and presentations about [Linux Terminal](#), and [supercomputer environment](#).
- Enhanced debugging of the core library source code lead to opening more than [10 bug reports](#) on the ROOT (C++) forum.